

Sweet Grass County

Pre-Disaster

Mitigation Plan

January, 2005

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1. Adoption of the Pre-Disaster Mitigation Plan

1.1. Resolutions

The Big Timber City Council passed Resolution 865 at their regular meeting on January 3, 2005. A copy of this resolution is in Appendix A.

The Sweet Grass County Commissioners passed Resolution 01-04-05 at their regular meeting on January 3, 2005. A copy of this resolution is in Appendix A.

1.2. Acknowledgements

Many government and private individuals were instrumental in the development of this plan. The DES Director and the Fire Chief were the most involved on the local level other than members of the county Local Emergency Planning Committee (LEPC) which includes the County Commissioners. The State Hazard Mitigation Officer gave valuable guidance throughout the process. Members of the community from several civic organizations offered input along the way and upon completion of the draft of the plan. The cooperation of the Big Timber Pioneer to print news releases and news items about the development of the plan helped to keep the public informed during the drafting process.

1.3. Introduction

Through the years, Sweet Grass County residents have experienced a broad range of natural and technological disasters. The county PDM Committee gathered information from local, state, and federal sources and from stakeholders in the community to design a plan to guide mitigation strategy in Sweet Grass County. This plan is considered a living document that will change with the community needs.

Sweet Grass County LEPC analyzed the following hazards for this plan:

- Fire
- Flood
- Severe Weather
- Hazardous Material Spills
- Infectious Diseases
- Earthquake
- Volcanic Fallout
- Terrorism/Bioterrorism

- Nuclear

These hazards were analyzed for risk and impact to the community. The PDM Subcommittee was responsible for proposing mitigation projects for each hazard to coincide with the county mitigation goals and objectives.

1.4. Purpose

The purpose of the PDM Plan is to assist county officials in prioritizing mitigation projects that will minimize damage and reduce recovery costs. Disasters can not be prevented but the community recognizes that a proactive approach can help save lives and money.

1.5. Scope

The scope of the PDM Plan included all private and public property inside Sweet Grass County including the City of Big Timber, and all hazards that have caused damage in the past and may cause damage in the future.

1.6. Authority

In 2000, the Disaster Mitigation Act amended the Stafford Act and required local jurisdictions to have approved PDM Plans. Future mitigation funding through the FEMA Hazard Mitigation Grant Program requires an approved PDM Plan to qualify for mitigation funds.

Sweet Grass County Board of Commissioners and the Big Timber City Council approved this plan as part of their regular meetings. The resolutions to approve this plan are included in Appendix A.

Sweet Grass County Disaster and Emergency Services will lead the necessary meetings, posted and open to the public, to update the county PDM Plan on a biannual basis. The Local Emergency Planning Committee will be the chief authority on recommending changes and the County Board of Commissioners and Big Timber City Council will approve the changes. The elected county and city officials will encourage the use of this plan whenever appropriate for other planning processes.

2. Planning Process

A PDM Subcommittee was formed and first met on November 4, 2002. The core members of the subcommittee included:

- Dan Tronrud, Sheriff/DES Coordinator
- Mark Stephens, Fire Chief
- Larry Juell, County Road Supervisor
- Betty Alexander, City/County Planner
- Willie Lattell, City Road Supervisor
- Tom Hanel, City Mayor
- One County Commissioner
- Kerry O'Connell, Deputy DES Coordinator/Mitigation Officer

The positions of the city road supervisor and the city mayor are now held by different people (Rick Gibby and James DeVenney, respectively) but by the time these posts changed, the bulk of the work for this plan had been completed.

LEPC members decided early on in the planning process that the subcommittee use the LEPC as much as possible instead of adding more meetings that would be difficult to coordinate. This was done throughout the process and worked very well. Existing plans were also used as much as possible and are referenced in this document. The most important existing documents to the planning process were the Sweet Grass County Growth Policy and the Sweet Grass County Flood Hazard Mitigation Plan.

Public involvement of the planning process was solicited in four ways. The Mitigation Officer posted flyers around town with contact information, called community leaders of civic organizations and offered presentations, posted information on the county Web site, and printed press releases in the local paper. The decision to speak at individual civic organizations was made in an effort to include more people throughout the community. Specific public meetings posted in the newspaper do not typically draw many people unless the subject of the meeting is controversial. A public PDM meeting was not expected to draw much of a crowd.

Public input was listed and brought to the subcommittee. It was obvious that almost all the issues were already being covered in the planning process. As the plan developed, members of the subcommittee reviewed the plan and suggested changes. The final draft was approved and posted on the county Web site for public comment.

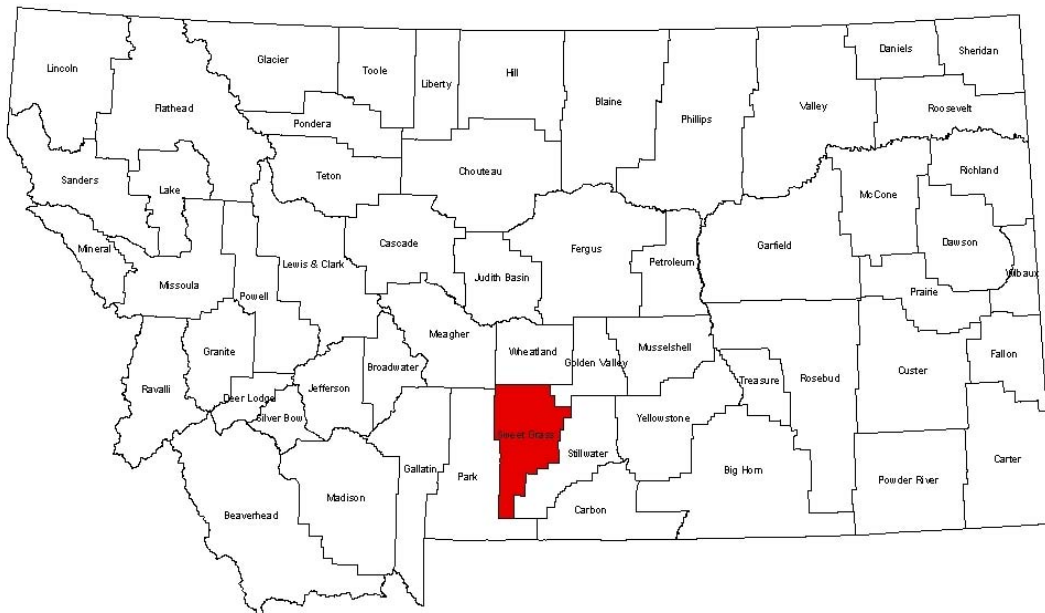
2.1. Documentation of the Planning Process

Appendix B contains documentation of public involvement, and minutes of the PDM Subcommittee meetings.

3. Description of the Community

3.1. Location

Sweet Grass County is located in South Central Montana as shown in Map 1. The City of Big Timber is the only incorporated town in the county and is responsible for services and maintenance to city property inside the city limits. The county includes 3 unincorporated towns, Melville, McLeod, and Greycliff. The county is responsible for services and maintenance of county-owned property outside the city of Big Timber. Emergency services overlap city and county jurisdictions and include everything inside the county as their response area. Law enforcement services are combined for city and county.



Map 1. Location of Sweet Grass County, Montana

3.2. Community Profile

Statistic	2000 U.S. Census Data
Population	3609
Percent population change, 1990 to 2000	14.4%
Square Miles of Land Area	1855
Persons per Square Mile	1.9
Persons 65 years old and over	17.6%
Percent Caucasian	97.0%
Percent Black or African American	0.1%
Percent American Indian and Alaska Natives	0.6%
Percent Asians	0.3%
Percent Hispanic or Latino	1.5%
Percent of persons reporting another race	0.7%

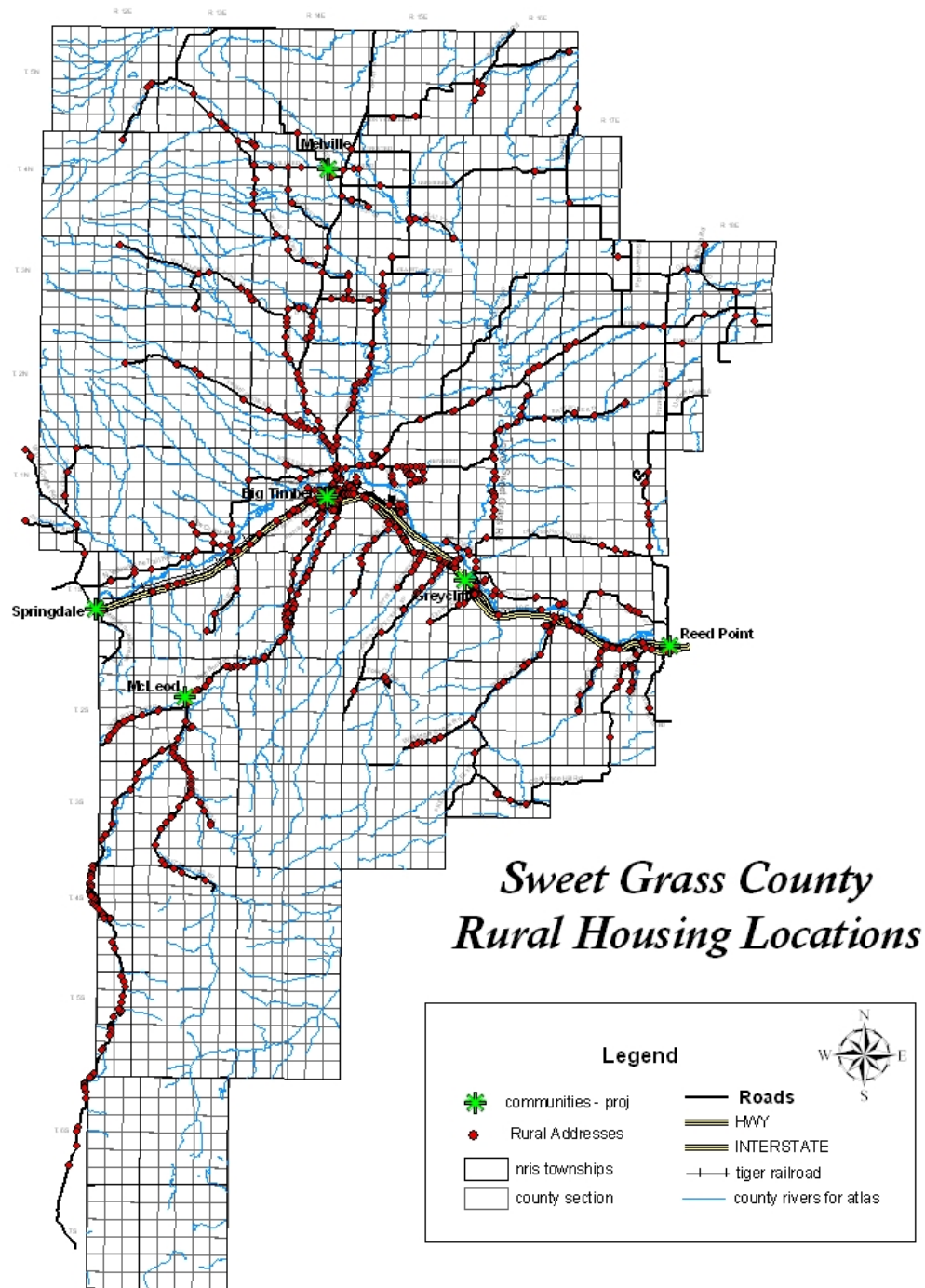
Table 1. Sweet Grass County Community Statistics (2000 U.S. Census)

Sweet Grass County business trends are best described from the Sweet Grass County Growth Policy (2003-2008):

“While still the dominant land use, agriculture has slipped slightly in its leading economic role. In 1970, agricultural jobs accounted for 35% of all county employment. Based on 2000 data, less than 23% of all jobs are in agriculture. Consolidation of land and improved equipment account for most of the reduction of agricultural jobs.

“Retail-related jobs account for 18% of all county jobs partially due to the increase in tourism and travel sectors. Thirty-five retail establishments were operating in the county in 1997. Tourism-related enterprises also bolstered employment and earnings in the service industry. Service now comprises at least 17% of all county employment. The 37 service establishments operating in 1997 included hotel and other lodgings, auto repair, health, personal, legal and other professional services. Government related jobs account for 16% of all county employment. The construction industry has also been steadily increasing since the 1970s in terms of earnings and employment.”

Per Capita income in 2000 was listed at \$19,968, and unemployment listed at 2.6% in 2003. A major employer in the county in recent years is the Stillwater Mining Company, operating a platinum and palladium mine on U.S. Forest Service land in the East Boulder drainage.



Map 2. Sweet Grass County Population Density According to Rural Housing Locations

About half of the population of Sweet Grass County is concentrated in or near Big Timber, the only incorporated town in the county. Big Timber is centrally located as depicted on Map #2. Other communities include Melville to the north of Big Timber, Greycliff to the east, and McLeod to the south. Springdale is a community just west of the county line in Park County, and Reed Point is just east of the county line in Stillwater County. Sweet Grass County emergency responders often respond to Springdale and Reed Point as part of a mutual aid agreement due to improved response times from our jurisdiction.

Map #2 is intended to show that most of the population in the county is concentrated either in Big Timber or nearest Interstate-90. The further from Big Timber, the more sparse the population, mainly due to the number of large ranches in the outlying parts of the county. The most obvious exception to this is south of Big Timber. The Main Boulder Road that extends furthest south and ends in Park County, contains mostly summer homes. Four church camps operate in this area in the summer months, as do several U.S. Forest Service campgrounds and cabins. Summer population in this part of the Boulder valley can easily exceed 3,000 recreationists.

4. Risk Assessment

4.1. Fire

4.1.1. Description

Fire is a fact of life in Sweet Grass County. While urban fires are considered a risk, wildland fire is considered the biggest threat. With the increased development of subdivisions and vacation cabins built in the urban interface, most wildland fires will threaten homes.

Fire was determined to be the number one hazard in SGC mainly due to common weather patterns. Almost without exception, a rainy spring is followed by a dry, hot summer. These conditions create an expected fire risk every July and August. Under drought conditions, fires can ignite at any time of the year (as demonstrated in the list of Previous Occurrences, Section 3.1.3). Ninety-nine percent of SGC is at risk for wildland fire and it is safe to say that all residents in the urban interface consider fire a significant problem.

The most common ignition source is lightning. Dry lightning storms have been responsible for igniting several fires simultaneously, and these multiple fires quickly exhaust county resources and almost always require help from outside agencies. Power lines blown down in the wind, controlled burns which get out of control, and vehicles on the interstate are also common ignition sources, particularly during unexpected times of the year.

Fire was identified as the number one risk through the PDM planning process and included input from:

- Current Fire Chief
- Past Fire Chiefs
- Sheriff
- County Commissioners
- Road Supervisor
- DES personnel
- County Planner
- The public
- US Forest Service

4.1.2. Description of Location and Extent

The risk of wildland fires is essentially a countywide hazard. The city of Big Timber encompasses only one percent of the total land area of the county and constitutes the only “urban” zone.

Fuel in the lower elevations of the county consists of grasses, sagebrush, juniper bushes, and ponderosa pine. In the creek bottoms, willows and cottonwoods preside. Fuels with low flashpoints, such as grass and sagebrush, create a fast-moving fire that can spread to heavier fuels.

In the higher elevations, lodgepole pine is the predominant species. Large fires can result when flames reach the forest canopy and spread in the crowns of trees particularly during wind events.

Several areas in the county stand out as high risk for wildland fires. The first area is the Boulder River Valley. The entire valley is approximately 50 miles long varying in width from a few miles to less than half a mile. For planning purposes, the West Boulder and East Boulder drainage are included with the Main Boulder drainage.

The highest wildland fire danger is in the southernmost 20 miles of the Main Boulder drainage extending from the Natural Bridge recreation area up to and including the Box Canyon. This 20-mile stretch is the narrowest part of the valley bordered by the steepest slopes and is mostly inside the Gallatin National Forest borders. Elevation levels of the Boulder Road, which runs alongside the Boulder River, climbs from about 5,200 feet at the Natural Bridge to 6,676 feet at the Box Canyon. The surrounding mountain peaks also increase in elevation accordingly from the peak of Green Mountain (closest to the Natural Bridge) at 7,337 feet, to Mount Douglas (above the Box Canyon) at 11,300 feet.

The Box Canyon trailhead allows access to the wilderness area north of Yellowstone National Park and is heavily used in the summer and during hunting season. It contains at least 140 residences and vacation homes. Four church camps in this corridor can accommodate 250 people each (sometimes more for special occasions) during the summer. This valley is a favorite destination for many tourists and summer residents.

In 2003, the US Forest Service was in the planning stage for a fuel reduction program to mitigate a large fire. Also in 2003, grant money was made available for private landowners in the corridor to reduce the fuels on their land. The two programs compliment each other well, and over the course of several years should decrease the fire danger. One benefit of this project will be to better protect homes through the use of defensible space. Another benefit will be to provide proper safe zones

where none exist between the Natural Bridge and the Box Canyon. The lack of any safe zones in the Boulder Valley above the Natural Bridge has been a topic of LEPC meetings for many years.

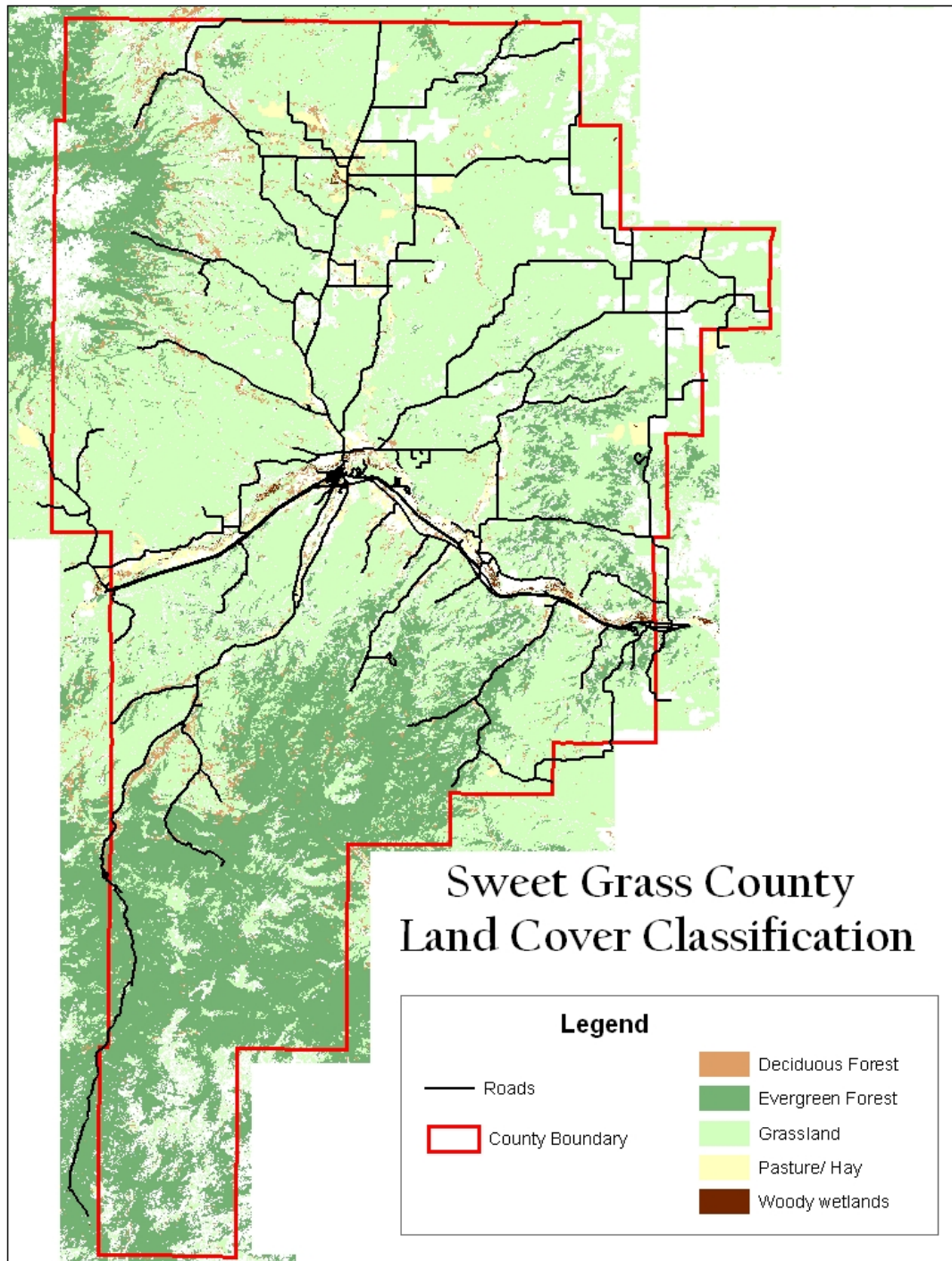
Another major concern has been the limited access provided by the Boulder Road. Because sections of the road are only narrow enough for one lane of traffic, emergency crews would be forced to make some sections of it a one-way road during emergency situations. In 2003, the first “bottleneck” on the Boulder Road was widened. Many more miles still need to be increased in width before it will be sufficient for emergency operations. If the fire burns too close to the road, emergency crews will require that the road be closed for safety reasons. Reducing the fuels in this corridor will also help to protect the road for continuous emergency access.

The next area of highest risk for wildland fires encompasses Bridger Creek, Work Creek, Hump Creek, and Lower Deer Creek drainages located south of Interstate-90 east of Big Timber. Lightning started fires are common in these areas where two subdivisions including about 60 houses are located.

The remaining areas of high risk for wildland fires are as follows:

- Howie Road area
- Mallard Springs Subdivision
- Indian Rings Subdivision/Old Boulder Road
- Stephens Hill
- Van Cleve and Caroccia Dude Ranches

The areas listed above all include a larger number of residences or a high number of recreationists.



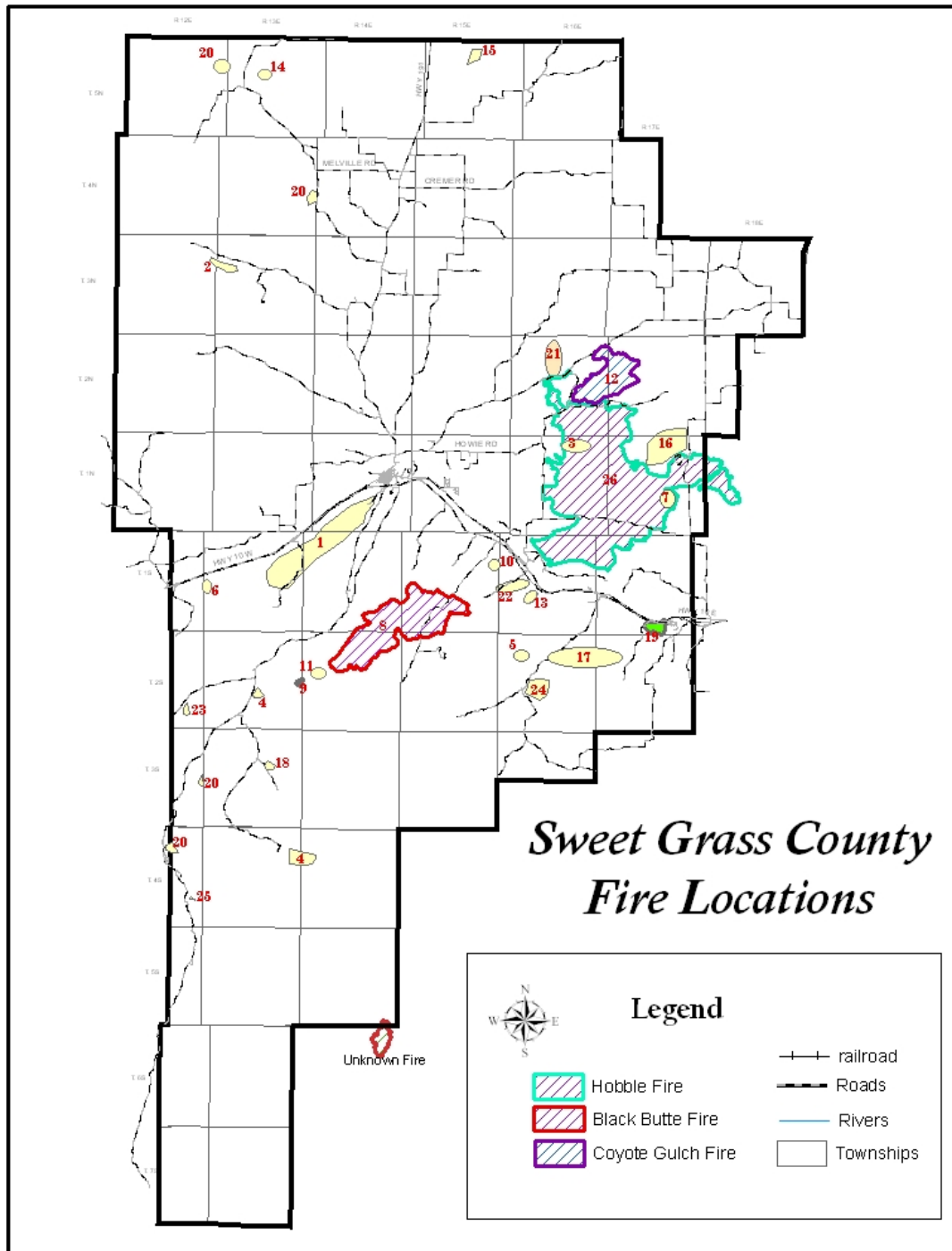
Map 3. Land Cover Classification Map

4.1.3. Previous Occurrences

The only major urban fire, which destroyed houses and businesses, took place in Big Timber in 1907. House fires in Big Timber have been isolated events since that time with the exception of one fire in the hardware store in 1972, which created an explosion that damaged several other buildings.

Wildland fires have been more frequent than urban fires. The areas affected by wildland fires range from hundreds of acres to thousands of acres. The following is a list of SGC fires which required outside resources (fires are shown on Map 4 as numbered in the list):

1. 1963, a wildland fire threatened the town of Big Timber;
2. July 1974, Devil Creek fire in the Crazy Mountains;
3. August 1983, Lone Indian Fire;
4. 1990 (approximately), multiple fires in the West, East and Main Boulder drainages;
5. October 1990 (approximately), Mothershead fire east of Big Timber;
6. Thanksgiving Day, 1991, power line started a fire west of Big Timber which forced the closing of Interstate-90;
7. July 1994, White Beaver Fire east of Big Timber;
8. August 1994, Black Butte Fire east of Big Timber in the Deer Creek drainage;
9. April 1996, Lower Deer Creek fire;
10. August 1996, Cherry Creek Fire south of Big Timber;
11. August 1996, Coyote Gulch Fire;
12. August 1998, fire east of Big Timber south of the I-90 rest area;
13. August 1999, Porcupine Butte Fire near Melville;
14. August 1999, Cooney Brothers Fire north of Melville;
15. August 1999, Stephens Hill fire;
16. December 1999, Christmas Fire east of Big Timber (Bridger Creek area);
17. July 2000, multiple fires south of Big Timber;
18. August 2000, Hump Creek Fire east of Big Timber;
19. September 2000, multiple fires in the Crazies and in the Boulder drainages;
20. August 2001, Tin Can Fire north of Big Timber;
21. September 2001, Flat Tire Fire east of Big Timber;
22. July 2002, West Boulder fire;
23. August 2002, Bridger Creek fires;
24. October 2002, Boulder fire near Clydehurst church camp.
25. August 2003, Hobble Fire (38,000 acres) west of and including Stephens Hill.



Map 4. Location of Previous Fires

The 38,000 acre Hobble Fire started on the evening of August 8, 2003 and was the largest fire in Sweet Grass County history. The speed of this fire was staggering as firefighters estimated it grew to 1,000 acres within two hours after lightning ignited it. GPS data showed it stood at 10,000 acres after 24 hours, and 30,000 acres after 48 hours. Each daily progression coincided with hot dry winds that drove the fire for three days. A week later it flared up again along Stephens Hill and burned another 8,000 acres and 4 residential buildings. Over the course of two weeks, 11 total outbuildings were also destroyed. Northwestern Energy replaced 42 structures supporting a major transmission line that carries electricity across the state of Montana.

On August 11, 2003, a storm front, associated with mostly dry lightning, passed through the county. County crews chased down and put out 14 new fire starts on that day and Forest Service crews fought three small fires in the Boulder Valley, causing officials to evacuate church camps and trailheads above Aspen Campground. All this on a day a Type 2 Incident Management took over management of the Hobble Fire.

4.1.4. Probability of Future Events

In our highest risk area, the Boulder River drainage, a recent US Forest Service study concluded the risk is high for a severe wildfire in the Main Boulder corridor south of the Natural Bridge. The reasons for this are:

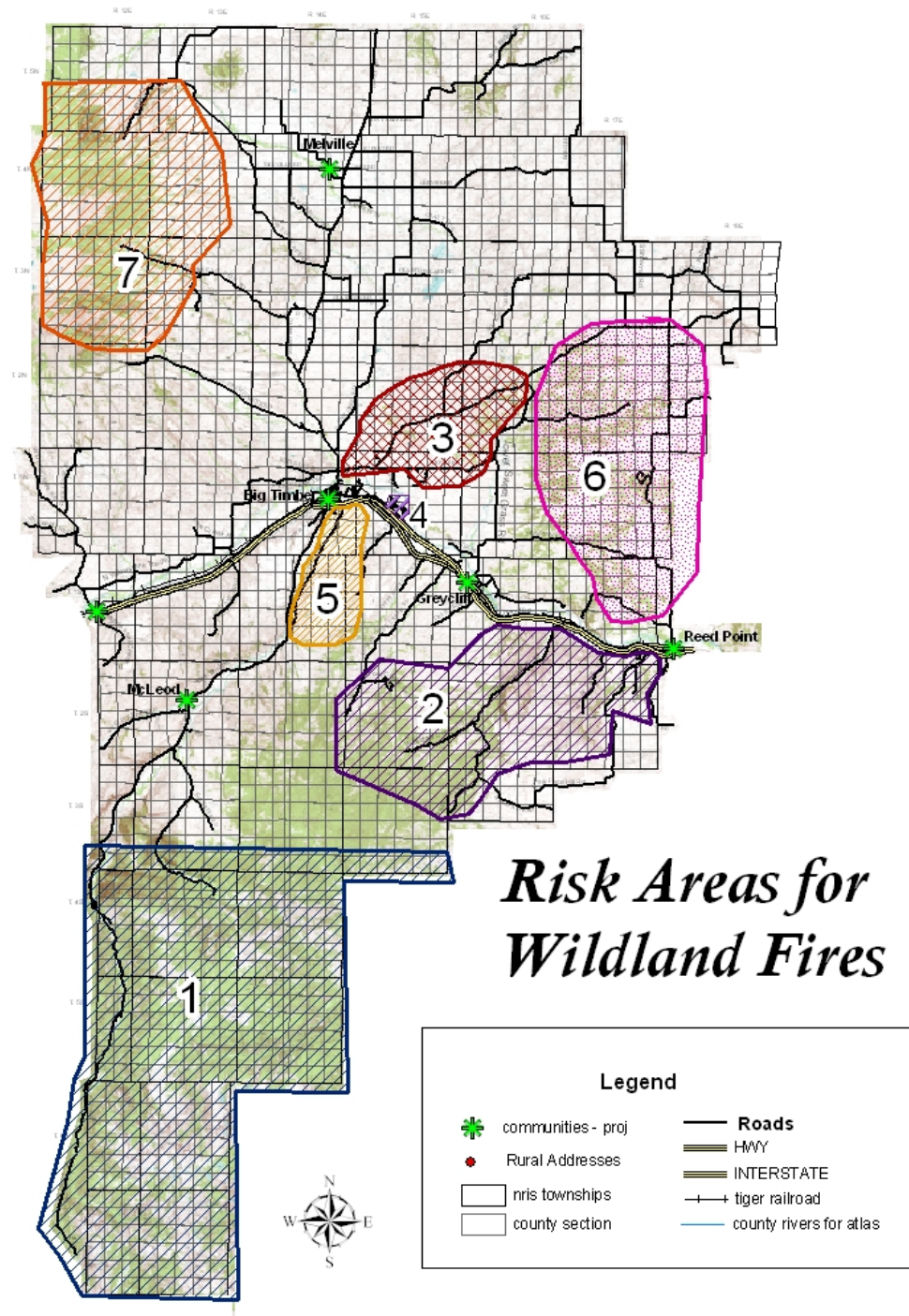
- Heavy dead and down surface fuels;
- Closed canopies;
- Thick ladder fuels to carry surface fires to the canopies;
- Multiple understories;
- Steep topography associated with strong down canyon winds.

According to the 2003 USFS study, *Main Boulder Fuels*, a wildfire in this area could travel about one mile per hour on the surface and about three miles per hour in the crowns under average wind speeds of eight miles per hour. A fire advancing at the estimated speed of three miles per hour could mean that the entire Main Boulder corridor would burn in one day.

Other areas listed as elevated risk for wildland fires include:

2. Bridger Creek/Hump Creek/Work Creek/Lower Deer Creek:
Fuels are mostly sagebrush, grasses, and stands of ponderosa pines which get thicker further south of the interstate.
Topography is mostly rolling hills with some steep coulees further south. This is a high risk area because of the presence of two subdivisions and other single residences, heavy fuels, and the past history of many lightning caused fires.

3. Howie Road: Fuels are mostly sagebrush and grasses with some mixed timber stands in the higher elevations of Rapelje Road and Lower Sweet Grass Road. Topography is mostly rolling hills. The risk of fire here rises with the elevation and drought conditions. This a major urban interface.
4. Mallard Springs: Fuels are mostly sagebrush and grasses, topography is flat. The risk of fire in this urban interface is mainly due to the close proximity of the railroad, a frequent ignition source.
5. Indian Rings Subdivision/Old Boulder Road: Fuels are mostly sagebrush and grasses with stands of timber in the higher elevations along the Old Boulder Road. Topography is mostly flat with some steep slopes further from the river. This urban interface is at a higher risk due to the increased possibility of human caused fires due to the high concentration of homes.
6. Stephens Hill: Fuels are grasses and sagebrush with heavy timber along the ridgetops and extending into steep coulees. Topography is rolling hills with steeper terrain in the higher elevations. This area is at a higher risk due to the frequency of lightning caused fires, areas of heavy fuel, and increased human caused fires due to the number of residences.
7. Van Cleve and Carrocia Dude Ranches; Although not at the same location, fuels and topography are similar. Fuels are grasses and sagebrush sloping towards heavy timber on the steeper slopes. Van Cleve topography is mostly steep slopes coming up from Big Timber Creek within Big Timber Canyon. Carrocia topography includes flat stretches in the valley surrounded by steep heavily timbered slopes. Higher risk of fires in these areas is due to the frequency of lightning caused fires added to the heavy fuels on the steep slopes.



Map 5. Fire Risk Areas

4.2. Flood

4.2.1. Description

Like wildland fires, floods are a seasonal occurrence in Sweet Grass County. Floods generally result from:

- Winter snowfalls creating spring runoff particularly during years of above average snowfall and sudden spring thaws;
- Sudden downpours in the mountains creating flash floods mainly in the summer months;
- Ice jams in early spring or late winter;
- Dam breach of one high-risk dam.

Participation:

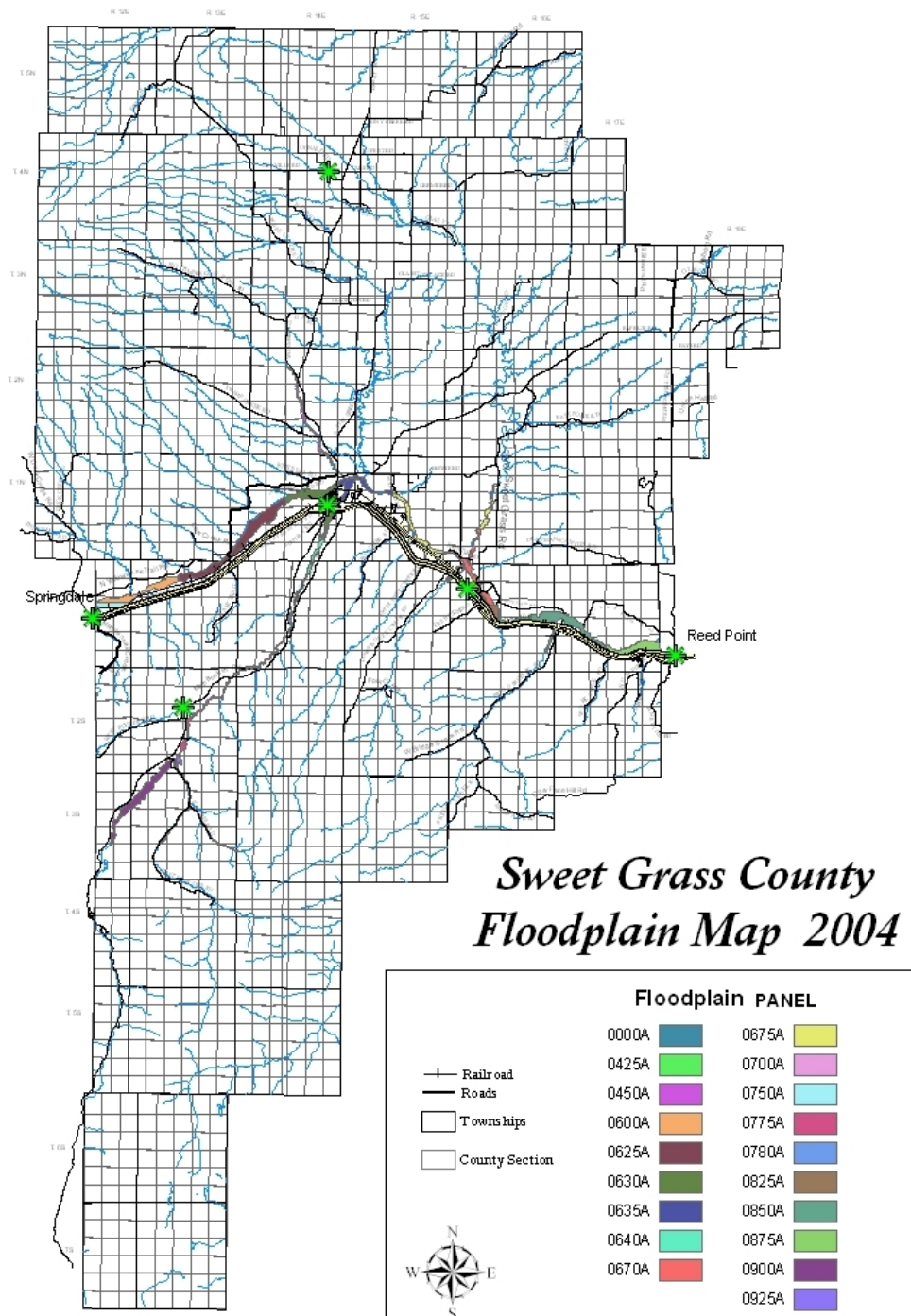
- Current Fire Chief
- Past Fire Chiefs
- Sheriff
- County Commissioners
- Road Supervisor
- DES personnel
- County Planner
- The public
- US Forest Service

4.2.2. Description of Location and Extent

The Yellowstone and the Boulder are the two major rivers flowing through Sweet Grass County. The Yellowstone flows east for about 40 miles across the central region of the county and is the largest river. The Boulder River flows north out of the Absaroka Mountains and empties into the Yellowstone near Big Timber. All other creeks in the county flow into these two rivers. Map 6 on page 19 is the 2004 Sweet Grass County Floodplain Map, and includes data from floodplain studies for the Yellowstone River, Boulder River, Lower Deer Creek, and portions of other small drainages.

Throughout the rural parts of the county, development of residences and ranches generally are along or near the banks of the rivers and creeks. Flooding conditions not only threaten residences, but also the roads, bridges and other infrastructure in these areas. Flash floods have been responsible for washing out bridges and roads and are the most difficult

flood conditions to mitigate because flash flood water levels can far exceed previous flood levels.



Map 6. Sweet Grass County 2004 Floodplain Map

The city of Big Timber has a minimal threat from the Boulder River. Flooding in Big Timber is usually due to locally heavy rainfall rather than from river flooding. The threat to major bridges in and around Big Timber is much more significant. These bridges include:

- Yellowstone Bridge just north of Big Timber: The loss of this bridge could cut off the northern part of the county from the town of Big Timber. A detour would require travelers to go several miles east of Big Timber to the next bridge over the Yellowstone—a bridge already highly threatened during flooding conditions.
- Boulder Bridge on Highway 10: The loss of this bridge would require a detour on Interstate-90.
- Boulder Bridge on Interstate-90: The loss of this bridge would require all interstate traffic to detour onto Highway 10 through Big Timber.

The areas of highest risk to flooding are:

- Yellowstone River
- Boulder River
- Lower Deer Creek
- Otter Creek (this drainage includes the high-risk dam)
- Sweet Grass Creek
- Big Timber Creek
- Suzy Creek
- Elk Creek

The highest areas of population density are on the Yellowstone and Boulder Rivers. Floodplain mapping along with seasonal flooding have encouraged development outside the floodplains.

4.2.3. Previous Occurrences

According to the Sweet Grass County Flood Hazard Mitigation Plan (adopted September 2002), major flooding on the Yellowstone was recorded in 1897, 1902, 1918, 1943, 1948, 1965, 1971, 1974, 1996, and 1997. The Boulder River had reported flooding in the years 1956, 1974, 1975, 1996, and 1997.

The closest Yellowstone River stream gauges are in Livingston and Billings. The five largest events on the Yellowstone are as follows:

- 1997: June 6, the Livingston stream gauge measured 38,000 cfs. June 12, the Billings stream gauge measured 82,000 cfs. Both these discharges were the highest flows recorded for these stations.

- 1996: June 10, the Livingston stream gauge measured 37,100 cfs. June 12, the Billings stream gauge measured 61,900 cfs.
- 1974: June 17, the Livingston gauge measured 36,300 cfs. June 19, the Billings gauge measured 69,500 cfs.
- 1943: June 20, Livingston measured 30,600 cfs. June 21, Billings measured 61,200 cfs.
- 1902: June 11, Livingston measured 30,100 cfs. Billings had no measurement available.

In 1997, flooding damaged both public and private properties along many drainages in the county. Sweet Grass County Fairgrounds, located in the Yellowstone River floodplain, cost the county \$15,000 to clean up, and county roads and bridges suffered about \$150,000 in damages. Private property claims paid through the FEMA flood insurance program totaled \$377,694 in 1997. A large portion of these claims were paid as a result of a flash flood on Otter Creek, a minor tributary in the northern half of the county which empties into the Yellowstone River. The same year a headgate breached at the Glasston Lake Dam causing flooding in the Otter Creek drainage, and an irrigation ditch on the West Boulder Road ruptured destroying one home and washing out a section of road. Other flash flood incidents that caused property damage were recorded in 1967, 1971, and 1976.

4.2.4. Probability of Future Events

As with wildfires, the probability of future flooding events is guaranteed. According to the Sweet Grass County Flood Hazard Mitigation Plan, FEMA sponsored a Flood Insurance Study for Sweet Grass County in 1982. This study identified flood prone areas within the county. Floodplain boundaries were mapped for these areas to assist the county in developing sound floodplain management measures. The identified flood prone areas are outlined and updated on the 2004 floodplain map, Map 6, but it should be noted that not all drainages in the county have been mapped.

4.3. Severe Weather

4.3.1. Description

The kinds of severe weather events common to Sweet Grass County include:

- Thunderstorms (with or without hail and/or tornados)
- High Winds
- Winter Storms
- Drought
- Avalanches
- Landslides

According to the National Weather Service about 10 percent of thunderstorms nationwide are classified as severe. Thunderstorms are caused by an imbalance in atmospheric conditions. Warm fronts colliding with cold fronts can produce hail, high winds (including microbursts), lightning, heavy rain, hail, and/or tornados. In Sweet Grass County, thunderstorms often form over the mountains and build in intensity in the foothills. These storms can cause damage to property, create flash floods, or ignite wildfires when dry lightning discharges from the storms.

High winds, over 50 mph, often occur in Sweet Grass County as high and low pressure fronts move through the area. The Yellowstone River valley from Livingston to Reed Point is known for serious wind events. These wind events damage buildings, and often blow down power lines sometimes resulting in fires. High winds can last one day or several days and affect different parts of the county, but most frequently affects the City of Big Timber and travelers on the interstate.

Severe winter storms, heavy snowfall, ice, or sleet, usually accompanied by windy conditions, is an annual hazard in Sweet Grass County. Storms can hit as early as September, and as late as May. These storms can be fatal to humans and livestock, and can damage property. The county's emergency service personnel are often in the most danger as multiple traffic accidents are typical in hazardous weather, and visibility is low. These storms can last days at a time, and depending on the amount of snowfall, can result in floods when the weather warms.

The drought cycle is a normal climatic event in the western United States. Historically, droughts are seven-year cycles and most often end in a spring flood event. Droughts affect ranchers because of poor forage and reduced water sources for livestock; affect tourism because of reduced

recreational opportunities and increased chance of wildfires; affect municipal water supplies; and affect wildlife health and overall wildlife populations. The drought cycle that began in 1998 has been one of the most severe in history. So far, this cycle has created significant fire seasons every year since 1998, and severe fire seasons during 2000 and 2003.

Avalanches occur when a wall of deep snow breaks loose from a steep slope. The snow picks up speed as it rushes down the mountain and can pick up anything that might be in its path including rocks, trees, and people. Avalanche danger depends on the depth of the snow, on the instability of the snowpack, and on the degree of slope. Six avalanches in Montana killed four people during the 2002/2003 season. Victims of avalanches may die of traumatic injuries suffered from being caught in the moving snow, or from suffocation from being trapped under the snow once it stops.

4.3.2. Description of Location and Extent

Severe weather can hit any and all parts of the county. According to the National Weather Service, weather accounts for 90% of all declared disasters in the United States. The area of highest impact has always been the Yellowstone River corridor because of I-90 and the town of Big Timber. The only exception to this would be in the event of severe drought where outlying regions would be affected first (as mentioned below), followed by the probability of water shortages in Big Timber.

4.3.3. Previous Occurrences

Many severe weather events correspond to past fires as seen on page 13. Drought has the biggest influence on fire ignitions and most large fires in the county are driven by high winds. In a few instances, high winds have knocked down trees into power lines that in turn ignited wildland fires. The most common ignition source is a lightning strike often accompanied by high winds.

Thunderstorms account for most of the weather data reported to the National Weather Service over the past 20 years in Sweet Grass County. Reported incidents include 23 of hail (largest reported diameter of 1 inch) and 6 of high thunderstorm winds (highest reported winds of 60 knots). Two tornadoes were reported also, 1 in 1965 and 1 in 1973. Both tornadoes were F1 or lower.

According to dispatch records, 19 wind events since 1984 have prompted calls to the Sheriff's Office. Some of these events created multiple problems. On July 9, 1994, calls included multiple downed trees including 1 on a trailer and 1 on a house, power poles and power lines down, and a camper blown off a truck. On January 30, 1997 power lines were blown down at the rural school in Melville. Additional results of wind events have included semi-truck accidents and a woman who was seriously injured when a tree fell on her tent. Historically, the worst wind events have happened when wind blows snow during or following a winter storm.

Significant winter storms have occurred nearly every year in Sweet Grass County. Problems occur when storms last for several days or when high winds reduce visibility down to a few feet. The winter of 1978 to 1979 is listed as a winter that produced hazardous conditions over a long period of time. The winter of 1996 to 1997 created similar conditions. High snow years cause responders to be busy with accidents, cars sliding off the roadways, snowplow accidents, and pile-ups. Most of the accidents concentrate on the interstate. The most recent winter storm incident began the week of Christmas in 2003. The day following an average snowfall amount of 12 inches, severe winds created a ground blizzard that essentially closed the interstate from county line to county line. The Red Cross sheltered nearly 300 people in Big Timber overnight, and it was estimated another 200-300 people filled hotels or found local residents who opened their homes to stranded travelers. Many accidents were listed that day, including one semi-truck narrowly missing responders on the scene of an accident involving a stock trailer loaded with 4 horses. No serious injuries were recorded from this storm.

Avalanches within the county have occurred in remote areas. Few instances of human involvement have been reported. The last instance happened in 2002 during an annual snowmobile event. The victim was dug out quickly and resuscitated successfully by fellow snowmobilers.

Landslides have occurred infrequently on some steeper slopes in the county and are closely associated with flooding. The most recent landslide was linked to a flood event on the West Boulder Road. This incident (also mentioned in Flooding section 3.2.3) happened when an irrigation canal collapsed after a heavy rain taking out a section of the road and destroying one house.

4.3.4. Probability of Future Events

The probability of future severe weather is a certainty in Sweet Grass County.

4.4. Hazardous Material Accident

4.4.1. Description

A hazardous material is any material that is capable of causing harm to humans, the environment, or property. These materials can be solid, liquid, or gas and are commonly used in, agriculture, medicine, industry and in consumer household goods. Examples would include acids, fertilizers, alkalis, radioactive material, petroleum products, and compressed gases, among others. The most common method of accidental release would be in a traffic accident or train accident where a large volume of material could release from a ruptured tank.

4.4.2. Description of Location and Extent

A hazardous material accident may happen anywhere there is human activity. While homes in Big Timber and around the county do have the potential of having small-scale accidents from fuel oil or propane tanks, the major threats in Sweet Grass County concentrate around the highways and the railroad.

Interstate-90 poses the greatest threat because many trucks haul hazardous materials. According to the FEMA publication titled, “Backgrounder: Hazardous Materials,” a spill is 5.3 times more likely to occur on a highway than on a railroad. Trucks also travel north on Highway 191 and south on Highway 298. The military sometimes uses Highway 191 to transport radioactive material. Stillwater Mine uses Highway 298 to transport explosives and other materials to the East Boulder Mine. Fuel oil and propane trucks also travel the gravel roads to homes around the county.

The I-90 corridor is clearly the highest threat in the county and planners have concentrated most of their efforts on this corridor. It includes the town of Big Timber, the railroad, and the Yellowstone River. A truck accident on the highway will most likely involve only one truck with one material, while the railroad has the potential to involve several cars all carrying different materials. In (or close to) the city of Big Timber, several retailers store diesel and gasoline in underground tanks and store propane above ground. One agriculture supply retailer sometimes stores large amounts of fertilizers, particularly during the spring and early summer. One hardware store and one lumber supply store carries a variety of hazardous household and building materials, and one grocery store carries household cleaning products.

4.4.3. Previous Occurrences

Over the past ten years, thirteen incidents in the county involved fuel spills from vehicle accidents. None of these were large-scale spills.

Fertilizer has been involved in at least two truck accidents. One truck had no fertilizer leak into the environment. The second accident occurred in January of 2003 and involved hundreds of gallons of liquid fertilizer leaking into the median of I-90. This particular spill required no special clean-up efforts as it was not classified as hazardous, but emergency responders did experience breathing irritation as they approached the vehicle to rescue a victim.

Over the past 30 years, major train derailments occurred in Big Timber on an average of one every 5-10 years. One or more minor derailments of one to two cars occurred more frequently. In 1989, a derailment spilled grain near the Grey Bear Fishing Access west of Big Timber. In 1991 a derailment east of Bridger Creek spread gravel and dirt across the frontage road. In 1997, a derailment at mile marker 373 near Mallard Springs spread mud across the interstate. All past derailments in Sweet Grass County did not involve the release of hazardous materials. According to Montana RailLink, the top ten hazardous materials shipped over their railway include gasoline, chlorine, ethyl alcohol, fuel oil, copper concentrates, liquefied petroleum gas, sulfuric acid, anhydrous ammonia, methanol, and sodium hydroxide. These ten materials make up 41% of the shipments. Additional hazardous materials may also be present in shipments and could include radioactive materials. The largest railway hazardous materials spill in Montana took place in Albion on April 11, 1996. A train car carrying chlorine gas ruptured, resulting in the death of one person, the hospitalization of over 350 people, and the evacuation of an 8-12 square mile zone. Other chemicals were also spilled including potassium persulfate. Interstate-90 through Albion was closed for 17 days and the derailment was eventually blamed on worn rails in the area.

Sweet Grass County has no history of accidents resulting from storage facilities such as gas or propane-filling stations. In 1972, a fire in the Coast to Coast hardware store created an explosion that damaged several neighboring buildings.

4.4.4. Probability of Future Events

LEPC members and the PDM committee agree that eventually a hazardous materials accident will happen. As mentioned above, it is slightly more likely to happen on the interstate than on the rails. With an increase in traffic on I-90 over the years, a major or minor hazardous materials accident is likely in the next 10 years.

4.5. Infectious Diseases

4.5.1. Description

Infectious diseases include epidemics, pandemics, major and minor outbreaks, and diseases spread by insect or rodent vectors. Each year Sweet Grass County experiences an outbreak of influenza. The County Health Department monitors for and investigates disease outbreaks that affect the population. Vector diseases such as West Nile Virus transmitted by mosquitoes, Bubonic Plague transmitted by fleas, and hantavirus transmitted through mouse droppings, have all infected people in Montana. Vectors responsible for spreading diseases are plentiful in Sweet Grass County.

4.5.2. Description of Location and Extent

The location of disease outbreaks is dictated by the proximity that residents have to infected people or to infected vectors. Residents in rural areas of the county may be at a somewhat higher risk to being exposed to most vectors, but ultimately, all county residents will be at some risk to these diseases.

4.5.3. Previous Occurrences

Two residents have been infected with West Nile and one with hantavirus in recent years. Rabies and Rocky Mountain Spotted Fever have been confirmed in neighboring counties but not in Sweet Grass. Influenza is a constant threat and our county has some residents test positive each year.

4.5.4. Probability of Future Events

Disease outbreaks and disease-carrying vectors will always threaten Sweet Grass County residents. The potential is there for a severe outbreak of an infectious disease, but prevention measures such as land use planning, public health surveillance, and public health education has helped prevent recent severe outbreaks. Continued attention to these measures are a priority for the county health department.

4.6. Earthquake

4.6.1. Description

The tectonic plates that cover the Earth can overlap each other or pass each other as they move. Earthquakes result when these plates move quickly to release accumulated pressure. Earthquakes produce severe damage depending on the magnitude of the event. Earthquakes have killed people, collapsed buildings, damaged electrical, sewer, and water lines, and damaged roads and bridges.

Earthquakes commonly occur around fault lines, where tectonic plates meet, but may also occur in the middle of the plates.

4.6.2. Description of Location and Extent

All of Sweet Grass County is vulnerable to earthquakes. According to the USGS Seismic Hazard Map in Figure 3.6.2, the southern tip and the western edge of the county are the most vulnerable. Both of these regions are in mountainous areas.

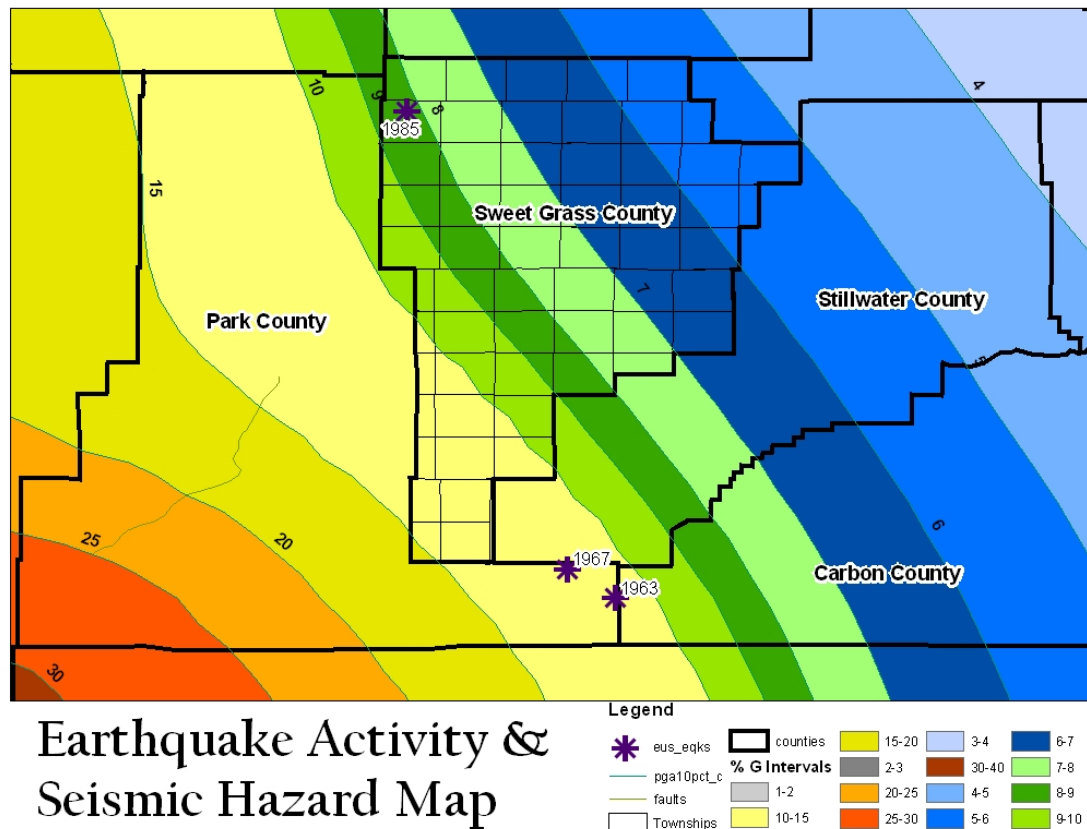
Areas of higher risk for earthquakes are much more prevalent to the south and west of Sweet Grass County. Minor earthquakes are a common occurrence in Yellowstone National Park several miles south of the county line and the largest earthquake in Montana history was about 80 miles southwest of the county line. More details of this earthquake are described below in section 4.6.3.

4.6.3. Previous Occurrences

In Map 7, the star in the northwest corner of Sweet Grass County represents the last known earthquake in the county, which occurred on August 22, 1985. This earthquake had a magnitude of 3, was located in the Crazy Mountains, and no damage was reported. Two earthquakes are also noted on Map 7, but both of these quakes were located in the mountains south of the county line. One of these quakes happened in 1967 with a magnitude of 3.9, the other happened in 1963 with a magnitude of 3.6.

The largest earthquake in Montana occurred in August of 1959 about 80 miles southwest of the county line. The Hebgen Lake quake had a

magnitude of 7.3 and killed 28 people in a public campground nearby. The location of this deadly earthquake was in a region of 30-40% g as compared to the Sweet Grass County high of 10-15% g. (See the next section, 4.6.4, for an explanation of “g”) The Hebgen Lake earthquake was felt in our county, but no damage was reported. Damage inside the county due to distant earthquakes is unlikely, but, depending on the extent of the damage in neighboring counties, emergency response from Sweet Grass County agencies would almost definitely be needed.



Map 7. Previous Earthquakes and Risk of Future Events

4.6.4. Probability of Future Events

As shown on Map 7, the highest values of earthquake-caused acceleration, expressed as a percentage of gravity, g, are between 10-15% g with a 10% probability that this range will be exceeded in 50 years. A 10% g acceleration rate may be the approximate threshold of damage to pre-1965 dwellings, according to the USGS, and it suggests that pre-1975 dwellings are likely to sustain some damage, while dwellings built or retrofitted to earthquake standards should have little to no damage. Earthquake building standards are not required in Sweet Grass County. This information suggests that it is likely an earthquake inside the

county lines will damage some of the houses in the county, particularly the older ones.

4.7. Volcanic Fallout

4.7.1. Description

The northwest region of the United States has as many as 37 volcanoes. Nearly all of these have been inactive for over 1,000 years. Exceptions to this include Mount Hood in Oregon that erupted approximately 200 years ago, and the most recent and well-known eruption was in Washington State when Mount Saint Helens erupted in 1980. Yellowstone National Park is also famous for the caldera that covers about one third of the land area of the park. The Yellowstone caldera formed 1-2 million years ago through volcanic activity. The Crazy Mountains, forming the western boundary of Sweet Grass County, are also volcanic in origin but have been inactive for thousands of years.

The volcanic hazard in Sweet Grass County comes from the fallout of volcanic ash resulting from an eruption in the general geographic area. Ash is made of rock pulverized into a fine dust that carries on the wind or upper atmosphere for hundreds or even thousands of miles. When it falls to the ground it accumulates on roads, rooftops, automobiles, and vegetation. The ash may also contain small pieces of light, expanded lava called either pumice or cinders. Fresh volcanic ash may be harsh, acid, gritty, glassy, or have a foul odor and may damage property and cause respiratory difficulties for residents and livestock.

4.7.2. Description of Location and Extent

Volcanic ash can fall on any and all regions of the county.

4.7.3. Previous Occurrences

Mount St. Helens in the state of Washington erupted on May 18, 1980, depositing large quantities of ash across Montana. Sweet Grass County was covered with non-toxic ash about two inches deep. Residents with prior respiratory problems were at highest risk to develop breathing difficulties. Property damage was minimal, and related to the abrasive nature of the sediment. Residents were encouraged to change the air

filters on their vehicles often to prevent engine damage. Ranchers were also warned to watch their livestock for breathing problems.

4.7.4. Probability of Future Events

Volcanic eruptions are not a common occurrence and it may be hundreds or thousands of years before Sweet Grass County experiences another volcanic ash emergency.

4.8. Terrorism/Bioterrorism

4.8.1. Description

The FBI defines terrorism as “the unlawful use of force or violence committed by a group or individual against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.”

Terrorist acts can include sabotage, bombing, assassination, kidnapping, the use of weapons of mass destruction, or merely the threat of any of these acts. Weapons of choice vary widely depending on groups involved and on availability of materials. In the past, terrorists have used non-traditional weapons such as the commercial airplanes used on the World Trade Center on September 11, 2001. One of the best preventative measures available is for citizens to report suspicious behavior and materials to law enforcement.

Since September 11, it has been accepted that the threat of international terrorism has risen, particularly for metropolitan regions. Officials believe that while the threat of international terrorism in Sweet Grass County is low, terrorist acts may be possible here. Rural residents inherently have a sense of insulation from the terrorist threats of bigger cities such as New York or Washington, D.C. These cities are centers of population, government, and contain cultural monuments. But to successfully carry out a terrorist act in a rural area could shatter the feeling of safety prevalent throughout the U.S. heartland.

Several other reasons exist for the possibility of a terrorist act in Sweet Grass County. Terrorists may use a rural area as a testing ground, testing out logistics of a plan on a small scale. An attack on Yellowstone Park, a well-known national icon, could easily involve Sweet Grass County emergency personnel in the response. In addition, Interstate-90 could be the highway of choice for terrorists to transport dangerous

materials, posing the risk of a motor vehicle accident and a hazardous materials leak in the county.

Agricultural terrorism, or agriterrorism, targets livestock and crops. Most agriterrorism diseases do not threaten lives of humans but are instead considered an economic attack. In Sweet Grass County, cattle and (to a lesser degree) sheep would be the most likely targets because they dominate the agricultural market. Cash crops are less likely targets because plant diseases are far too weather dependent to be reliably effective. It should be noted that the history of agriterrorism in the United States has been practically non-existent because animal and crop disease outbreaks have not been previously investigated as terrorist acts.

Agriterrorism may be the method of choice in Sweet Grass County because:

- The perpetrator risks less physical harm due to the lack of humans in the target areas;
- The backlash is not expected to be as severe as a method that targets people;
- The attack can mimic a natural disease outbreak, decreasing the risk of discovery;
- And the attack needs relatively low-tech equipment.

Domestic terrorists also remain a threat in Sweet Grass County. The largest industrial target inside the county is the East Boulder Project of the Stillwater Mining Company. Federal agencies such as the National Forest Service are other known targets of domestic terrorists. Sweet Grass County has federal office buildings and thousands of acres of National Forest land. Ecoterrorist groups have been active in the state of Montana but have not yet targeted Sweet Grass County.

4.8.2. Description of Location and Extent

The probability of a terrorist attack is low in Sweet Grass County but is most likely to occur near the town of Big Timber, especially on the interstate. An event on the interstate would affect the residents of Big Timber, interstate travelers, and the residents of surrounding counties.

The probability of an agriterrorism attack is also low, but may be slightly more likely in conjunction with a wider attack on the beef industry in Montana. According to the 1997 USDA Census of Agriculture (the latest census available), Sweet Grass County has 50,652 cattle and calves, and 12,518 sheep and lambs. Sweet Grass County officials estimate that a serious airborne disease could affect over 50% of the livestock in the

county. While every ranch is exposed to some risk, the highest risk target is the stockyards. Nearly all of the commercial producers weigh and ship their livestock out of these stockyards which are located just north of the Big Timber city limits. Exposure starting at these stockyards could infect feedlots throughout the Midwest, and throughout the county.

4.8.3. Previous Occurrences

No terrorist attacks have ever been recorded in Sweet Grass County.

4.8.4. Probability of Future Events

The probability of a terrorist attack in the future is low for Sweet Grass County.

4.9. Nuclear

4.9.1. Description

The probability that Sweet Grass County will be the target of a nuclear attack is very low. Nuclear missile silos still exist in various parts of the state, however. The US Government transports radiological material to Great Falls through Sweet Grass County on a regular but infrequent basis. Montana RailLink also transports radiological material. The main threat to Sweet Grass County is from an accident during transport. Also, due to high winds, a radiological leak in another part of the state could affect Sweet Grass County.

4.9.2. Description of Location and Extent

The areas of highest threat are along the I-90 corridor and Route 191 North. The I-90 corridor includes the interstate and the railroad, and 191 North is a common route to Great Falls.

The extent of radiological contamination depends on weather conditions. Even if the source of the contamination was near the town of Big Timber, the entire county could be affected within a few days, as well as other regions of the state and country. The greatest threat from accidental

exposure is to the lives of the county residents as property damage will most likely be minimal depending on the size of the accident scene.

4.9.3. Previous Occurrences

Sweet Grass County has no history of nuclear accidents.

4.9.4. Probability of Future Events

Probability of a radiological event is very low.

5. Assessing Vulnerability

5.1. Future Growth and Land Use Trends

According to the 2003 Sweet Grass County Growth Policy (approved March, 2003), current land classifications show that the county is primarily agriculture-based. Over 64% of the land area is taxed as agriculture; federal land constitutes 25%; private timberlands constitute 6%; state lands constitute 4%; and residential tracts amount to less than 1% of the total land base. Table 2, from the Growth Policy shows a detailed list of land classifications.

<u>LAND USE CLASSIFICATION</u>	<u>ACRES</u>
Agricultural	
Irrigated	31,965
Non-irrigated	18,417
Wild hay	18,548
Grazing	<u>687,287</u>
Total Agriculture	756,217
One Acre Farmsteads	486
Private Timberland	70,966
Commercial Tracts	176
Industrial Property	585
Tract Land	
Less than 20 acres	1,500
20-160 acres	<u>6,442</u>
Total Tract Land	7,942
City/Town	480
Exempt*	
Agricultural	1,926
Residential	<u>16</u>
Total Exempt	2,123
Federal (F.S., BLM, Water)	299,135
State	48,510
GRAND TOTAL	1,186,620

*Exempt means non-taxed property that is owned by nonprofit, state, federal or school entities.

Table 2. Land Use Classification

Projected land use trends are expected to remain fairly consistent to that shown in Table 2. As the agricultural economy goes through cycles of economic pressures, the potential is that some ranch property may convert to recreational use. Citizen value of open space is expected to increase and more encouragement and support may arise for citizen initiated zoning actions that protect open spaces.

The county population is expected to increase between 200 to 700 people within the next 10 years. At an average household population of 2.4, this expected growth could generate a demand for 83 to 292 additional dwelling units. The 1998 East Boulder Hard Rock Mining Impact Plan projected approximately 70% of the mine related population to live in the county. Of that growth, the majority would be located within the city-county planning jurisdiction. Currently close to half the population in the county live within the city limits. It is expected that properties adjacent to Big Timber will develop and developments adjacent to the city would be annexed when they are platted. A reasonable projection for housing needs in the rural county would be approximately 20-30% of the expected growth from the working and leisure populations, or 20 to 80 dwelling units.

With the expansion of the city limits expected, the risk of wildland fire near the city limits will also increase. The number of homes in the urban interface is also expected to increase.

5.2. Estimating Losses

5.2.1. Methodology

The methodology for determining the value of all structures and infrastructure comes from the tax assessor's office. Taxable property was broken down by school district with Reed Point and Greycliff districts combined for simplicity. Map 8 shows the location of the school districts used for this assessment.

Because residential and agricultural buildings are assessed together, the PDM Subcommittee estimated 5 ranch buildings for every ranch in the county. With 301 ranches listed in the 1997 USDA census of Agriculture, the total number of ranch buildings was estimated at 1505 for the county. Cost was estimated at \$9,000 for each ranch building which would take into account the buildings that were worth very little (or nothing) and the ones that were worth over \$100,000. The committee agreed that these numbers for agricultural buildings are probably on the low side, but the value of the buildings are not lost because they are assessed together with the residential structures on the ranches.

The value of churches was estimated because tax-exempt properties are not listed on the tax lists. With the information that some of the 12 churches provided, the committee was able to agree that each church could be estimated at \$386,000 and this figure would include parishes and other buildings owned by that church. Using information gathered from some of the church camps in the Boulder Valley, three of the camps were estimated at \$3,500,000 and the smallest church camp was estimated at \$1,750,000. This made the total of the religious buildings in the county worth \$16,882,000.

It was also agreed that machinery would be included in the inventory of assets because machinery is so important to ranchers and businesses in the county. The McLeod school district is a rural district, but includes the Stillwater Mining Company. This is the main reason the value of machinery in this district is so high compared to other similar districts. After reviewing the value of machinery, the PDM Committee felt that it must be included in this plan.

Critical infrastructure was inventoried through the city, county, and school insurance values.

Buildings in Sweet Grass County:

- 1860 residential worth \$78,586,494
- 195 commercial worth \$13,398,946
- 6 industrial worth \$11,562,648
- 1505 agricultural worth \$13,545,000
- 16 religious worth \$16,882,000
- 4,016 machinery worth \$90,881,995

Buildings in the Melville School District:

- 143 residential worth \$5,959,374
- 1 commercial worth \$195,012
- 0 industrial
- 181 agricultural worth \$1,629,000

- 1 religious worth \$386,000
- 1,083 machinery worth \$2,924,610

Buildings in the Big Timber Grade School District:

- 441 residential worth \$26,362,882
- 12 commercial worth \$2,045,697
- 1 industrial worth \$166,518
- 557 agricultural worth \$5,011,650
- 1 religious worth \$386,000
- 1201 machinery worth \$3,083,091

Buildings in the City of Big Timber

- 660 residential worth \$27,664,462
- 180 commercial worth \$10,269,666
- 4 industrial worth \$1,180,590
- 0 agricultural
- 10 religious worth \$3,860,000
- 212 machinery worth \$4,157,095

Buildings in McLeod School District:

- 314 residential worth \$9,756,244
- 1 commercial worth \$577,285
- 1 industrial (mine) worth \$10,215,540
- 389 agricultural worth \$3,501,000
- 4 religious (church camps) worth \$12,250,000
- 730 machinery worth \$79,893,989

Buildings in Springdale School District:

- 3 residential worth \$71,346
- 0 commercial
- 0 industrial
- 2 agricultural worth \$18,000
- 0 religious
- 23 machinery worth \$54,470

Buildings in Greycliff and Reed Point School Districts:

- 299 residential worth \$8,773,536
- 1 commercial worth \$311,286
- 0 industrial
- 376 agricultural worth \$3,384,000
- 0 religious
- 661 machinery worth \$1,834,062

5.2.2. Critical Infrastructure

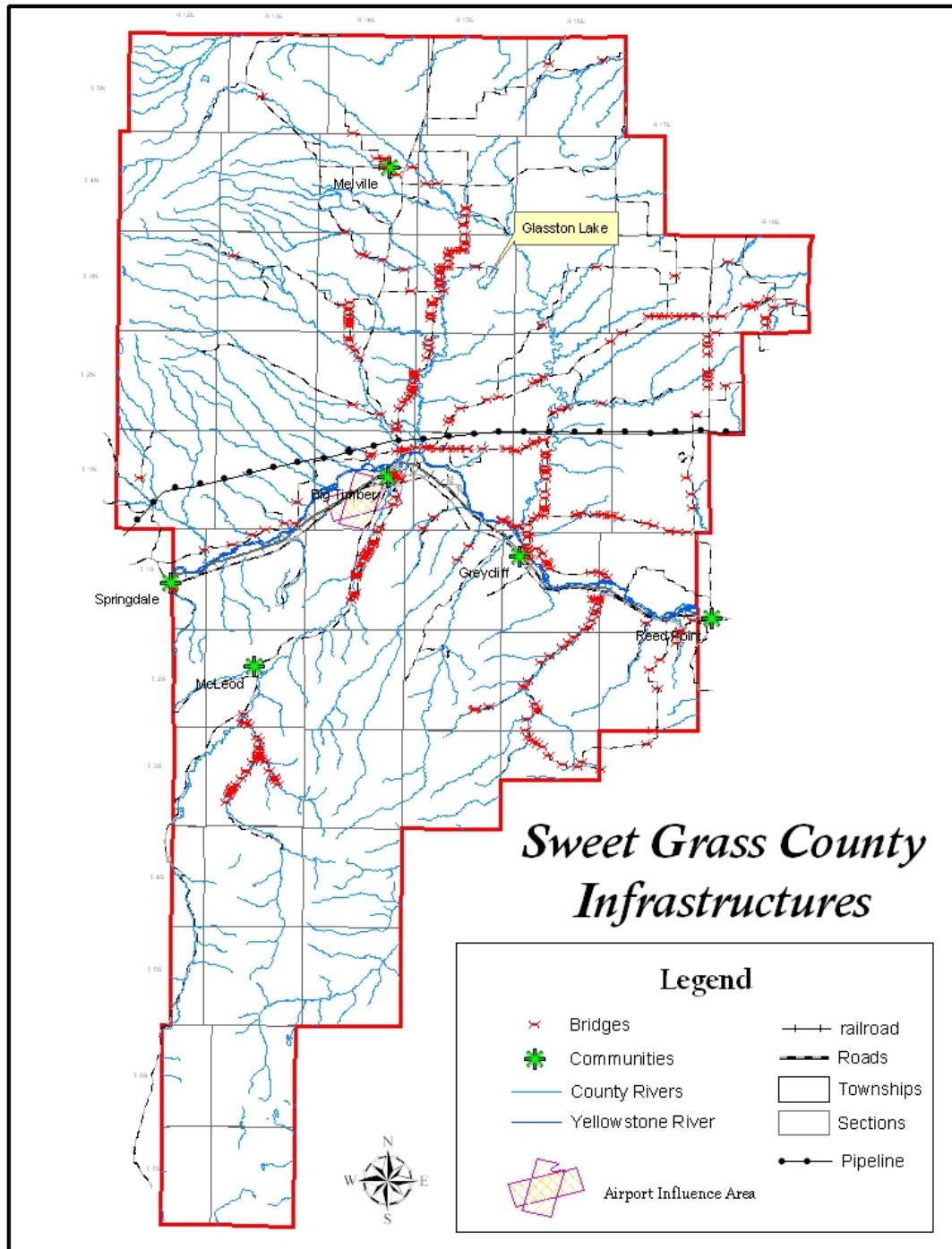
Asset	Size of Building (sq. ft.)	Replacement Value (\$)	Contents Value (\$)	Total Value (\$)
Big Timber City Hall	5250	169,000	38,000	207,000
Water Pump Building	200	10,300	34,000	44,300
Water Intake Building	250	14,420	14,420	28,840
Water Tank	N/A	216,800	N/A	216,800
Lift Station	N/A	88,000	N/A	88,000
Yellowstone Lift Station	N/A	80,500	N/A	80,500
Lagoon	N/A	837,000	N/A	837,000
Fire Hall	10,250	404,000	65,000	469,000
Solid Waste Transfer Station	950	60,000	N/A	60,000
County Courthouse	7326	576,000	108,000	684,000
County Shop	6408	42,000	24,000	66,000
Pioneer Medical Center	41,200	5,100,000	234,000	5,334,000
Old Hospital (county offices)	14,601	1,200,000	5,500	1,205,500
Elementary School	34,129	3,905,000	768,000	4,673,000
County High School	57,142	4,857,000	1,591,000	6,448,000
Civic Center (Shelter)	10,432	938,000	87,000	1,025,000
Melville School	1590	136,000	26,000	162,000
McLeod School	1200	125,000	34,000	159,000
Greycliff School	3064	260,000	65,000	325,000
Springdale School	2280	148,000	34,000	182,000

Table 3. Critical Infrastructure Values

Values still to be determined of other businesses and structures that are considered critical infrastructure:

1. Electrical substation
2. Triangle Telephone building
3. Gas stations
4. Roads and bridges
5. Sewer lines
6. Water lines
7. Gas pipelines
8. Post Office
9. USDA Building

Locations of infrastructure are shown on Map 9 on the next page.



Map 9. Sweet Grass County Infrastructures

6. Mitigation Strategy

6.1. Local Hazard Mitigation Goals

The PDM Subcommittee determined seven mitigation goals.

1. Improve communications capabilities.
2. Improve first responder capabilities.
3. Reduce wildland fire risk in the urban interface.
4. Reduce the risk from severe weather events.
5. Reduce the risk from hazardous materials.
6. Reduce the risk from biological hazards.
7. Reduce the risk from agricultural threats.

6.2. Identification of Mitigation Measures

LEPC members developed mitigation measures and classified them within each identified goal.

Communications:

1. Improve security in and around the dispatch center.
2. Purchase a mobile command post trailer.
3. Expand the county Web site and better publicize it.
4. Assess communication needs in the county.
5. Research additional locations for radio repeaters and/or cell phone towers.
6. Install additional radio repeaters and/or cell phone towers.
7. Purchase additional handheld radios for emergency services.
8. Improve the county early warning system, including radio, TV, and sirens.
9. Develop public education to inform the public about county disasters.
10. Develop an official network of ham radio operators and research funding sources for improved equipment.

First Responders:

1. Improve the 911 system by implementing E911 in a timely manner.
2. Purchase a mobile command post trailer.
3. Assess and improve the Emergency Operations Center and determine when to include a joint information center.
4. Improve the county early warning system.

5. Provide more opportunities for training, including sending three first responders to “train-the-trainer” sessions when available.
6. Establish a schedule of training exercises.

Wildland Fire:

1. Support action groups in the county with fuels reductions projects.
2. Continue to assist the public with defensible space issues.
3. Install dry hydrants in subdivisions.
4. Include wildland fire risk considerations when reviewing subdivision regulations.
5. Purchase better firefighting equipment.
6. Provide more opportunities for advanced training.
7. Provide public education about wildfire mitigation.
8. Expand the county Web site and better publicize it.
9. Recruit more firefighting personnel.

Flooding/Severe Weather:

1. Prioritize bridge replacement throughout the county, starting with the bridge across the Yellowstone on Lower Sweet Grass Rd. near Greycliff.
2. Provide bank stabilization, using natural stabilization methods whenever practical.
3. Establish and prioritize culvert and road projects.
4. Continue to reassess and revise floodplain regulations in conjunction with future development planning.
5. Improve the county early warning system.
6. Provide more opportunities for public education in cooperation with the National Weather Service.
7. Establish a emergency notification system after enhanced 911 is implemented.
8. Assess the need for portable electronic warning signs for law enforcement.
9. Expand the county Web site and better publicize it.

Hazardous Materials:

1. Research better security options for the current hazardous materials in the county.
2. Work more closely with the railroad to develop mitigation projects.
3. Research and/or establish truck routes.
4. Improve city/county regulations where applicable.

Biological Hazards:

1. Establish pest control measures when appropriate.
2. Monitor disease outbreaks in neighboring counties and states through the use of the Public Health Network.

3. Support updates and exercise of the mass vaccination plan.
4. Support public health planning.
5. Provide more opportunities for public education in cooperation with Public Health.
6. Expand the county Web site and better publicize it.
7. Work with Public Health to prepare press releases for the diseases at highest risk for county residents to contract.

Bioterrorism/Agricultural Threats:

1. Plan for mass vaccination of livestock.
2. Establish reporting practices in conjunction with the local veterinarians.
3. Provide more opportunities for public education.
4. Provide appropriate training for first responders and ranchers when appropriate.

6.3. Implementation of Mitigation Strategy

The PDM Subcommittee determined the highest priorities are:

- E911 implementation;
- Interoperable communications plan;
- Greycliff bridge over the Yellowstone;
- Mobile command post trailer;
- Wildland fire mitigation support.

The subcommittee chose projects according to funding availability and benefit to the community. Individual project costs are either compared between vendors or put out for bid, depending on the cost of the item. Four of these five items showed superior benefit to the community in improved response to disasters and in decreased threat of catastrophic wildfires. Funding for the command post and the communications plan is through Homeland Security. Funding for E911 is through the jurisdiction 911 allocation, but current funding may need to be supplemented depending on the specific equipment to be purchased. The wildland fire mitigation project in the Boulder River Valley is funded through the National Fire Plan (administered through state and federal agencies), and the county is fully supportive of the project. The Greycliff bridge project has been a priority for some time, but the current drought has kept river levels low enough that the river channel has not continued to reroute around the bridge. This could change very quickly depending on flood conditions.

Many of the projects listed are ongoing through normal departmental activities. The LEPC will serve as the funnel to perform the cost-benefit analyses of proposed projects. The Greycliff bridge project will be analyzed by December of 2005. Individual projects will be developed as the plan is updated.

6.4. Monitoring, Evaluating, and Updating

The LEPC will assign updating responsibilities to the PDM Subcommittee. The PDM projects list will be reviewed and updated yearly as projects are completed. A major review of the entire plan will be completed every 5 years.

It has been discussed that this document should be in a continuous revision process. As projects move up the list in priority, a more detailed assessment will be performed and included in the Plan. For example, the fire assessment section will be expanded by summer of 2005. All wildland mitigation projects scheduled throughout the county are intended to be added to the Plan as they are researched and planned.

Public discussion has been welcomed throughout the planning process, and several local groups have shown interest in contributing to assessment needs and project priorities. These groups have been invited to participate in the planning process by attending LEPC meetings. All updates will be approved through the LEPC, a committee that includes the county commissioners, and at least one city council member. LEPC members will incorporate existing plans (such as capital improvement plans, flood mitigation plans, subdivision plans, etc.) into the PDM revision process.